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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/718,679	11/22/2000	Rajcev Shorey	JP920000271US1	5343

7590 08/27/2004

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EXAMINER

SCHEIBEL, ROBERT C

ART UNIT	PAPER NUMBER
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2666

DATE MAILED: 08/27/2004

10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/718,679

Applicant(s)

SHOREY ET AL.

Examiner

Robert C. Scheibel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 November 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8.9.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:
 - On page 10, in the sentence starting with "In this phase the loss-window...", the word "ad" should be changed to "and".
 - On page 10, in the sentence starting with "The system remains in this phase...", the word "loses" should be changed to "losses".
 - On page 12, the paragraph starting with "Figure 2 shows..." doesn't match the flow in the figure. Specifically, the timeout is checked only if an acknowledgement is not received, contrary to the description in the text. Also, the lookahead-loss is detected if an acknowledgement is received, not if no timeout was detected. See the related description in the paragraph starting with "Whenever the lookahead loss..." for an example of how to word this description.
 - On page 12, in the last sentence, "2.13" should be "2.12".
 - On page 14, in the paragraph starting with "Once in the 'K' state...", the word "tat" should be "that".

Appropriate correction is required.

Drawings

2. The drawings are objected to because Figure 3 is not consistent with the description in the specification. For example, the transition between K and O

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states should occur when all losses are recovered, rather than when $\geq k$ losses are detected (as specified in the figure). Similarly, the transition between O and K states should occur when $\geq k$ losses are detected (and not when all losses are recovered as specified in the disclosure.) Also, there are a number of instances where loss window (lwnd) is discussed in the specification and shown as the congestion window (cwnd) in the figure.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims **1, 8, and 15** are objected to because of the following informalities: the period in line 4 should be either a comma or semi-colon. Appropriate correction is required.
4. The term "packet" is used throughout the claims as the unit transferred using TCP. Conventionally, the term "segment" is used with the TCP protocol. The claims should be updated to replace "packet" with "segment".

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims **2, 5-7, 9, 12-14, and 16, 19-21** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims **2, 9, and 16**, the phrase "an appropriately selected number, typically three" is indefinite and should be removed or reworded to be definite.

Claims **5-6, 12-13, and 19-20** recite the limitation "the congestion window" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Regarding claims **7, 14, and 21**, the phrases "more accurate estimation", "quicker retransmission" and "faster recovery" are indefinite. For example, it is unclear what how the estimation is more accurate (relative to what). As these claims appear to merely recite the benefits of the system, method, and computer

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program of the present application, it is recommended that these claims be cancelled.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims **1, 3-4, 8, 10-11, 15, and 17-18** are rejected under 35

U.S.C. 102(b) as being anticipated by the article “Selective Slow Start: A Simple Algorithm For Improving TCP Performance in Wireless ATM Environment” by Varshney.

Regarding claims **1, 8, and 15**, Varshney discloses a system for improving TCP throughput over lossy communication links without affecting performance over non-lossy links comprising (see the title and abstract): means for determining lookahead-loss which is the number of lost packets in a given loss-window (see the “COMPUTE N_LOSS” procedure in Figure 3), means for using said loss -window and said lookahead loss to detect congestion in said communication links (see lines 3-8 of the fourth paragraph of the second column of page 466 the second full paragraph of the first column page 467 which describes how the computation of N_LOSS helps detect whether the packet loss is due to congestion), and means for controlling transmission under congestion

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conditions as well as under normal conditions (see the last 7 lines of the second column on page 466 and the second full paragraph of the first column page 467). The method and computer program of claims 8 and 15 contain similar limitations and are rejected as indicated above.

Regarding claims **3, 10, and 17**, Varshney discloses the limitation that said means for detecting congestion is a mechanism for identifying when the number of packets lost in a loss-window is greater than an appropriately selected preset number (see lines 3-5 of the second full paragraph of the first column of page 467).

Regarding claims **4, 11, and 18**, Varshney discloses the limitation that means for controlling transmission is a TCP k-SACK protocol which is a modification of the fast retransmit algorithm of the basic congestion control algorithm of TCP to include: entering a 'halt growth' phase whenever lookahead loss is greater than zero and congestion is not detected, entering a 'k-recovery phase' whenever the congestion is detected (see lines 16-20 of column 2 of page 465).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims **2, 9, and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over the article "Selective Slow Start: A Simple Algorithm For Improving TCP Performance in Wireless ATM Environment" by Varshney in view of RFC 2001 by Stevens.

Varshney discloses all the limitations of parent claims 1, 8, and 15 as specified in the rejection above. Varshney does not disclose expressly the details of how a loss is computed as specified in claims 2, 9, and 16.

Stevens discloses in the second paragraph of section 3, that if 3 or more duplicate ACKs are received in a row, this indicates a loss. This discloses the limitation that the lookahead-loss is incremented when the sender has received at least max-dupacks (an appropriately selected number, typically three) duplicate cumulative acknowledgements. The limitation that the lookahead-loss is incremented if the sender has neither received acknowledgement nor selective acknowledgement for said packets, while it has received selective

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acknowledgements for at least max-dupacks (an appropriately selected number, typically three) packets with higher sequence numbers is obvious in view of this teaching of Stevens as applied to selective ACKs as the same principle is involved in distinguishing between losses due to congestion and losses due to other reasons.

Varshney and Stevens are analogous art because they are from same field of endeavor of TCP congestion control. At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Varshney to use the duplicate acknowledgements as taught by Stevens to compute N_LOSS. The motivation for doing so would have been to implement the selective slow start of Varshney while modifying TCP as little as possible. Therefore, it would have been obvious to combine Stevens with Varshney for the benefit of minimizing the changes to TCP to obtain the invention as specified in claims 2, 9, and 16.

11. Claims **5-7, 12-14, and 19-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over the article "Selective Slow Start: A Simple Algorithm For Improving TCP Performance in Wireless ATM Environment" by Varshney in view of the article "Differentiating Congestion vs. Random Loss: A Method for Improving TCP Performance over Wireless Links" by Parsa et al.

As explained in the rejection under 35 U.S.C. 102(b) above, Varshney discloses all the limitations of the parent claims 4, 11, and 18. Varshney does not disclose expressly the limitations recited in claims 5-7, 12-14, and 19-21.

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Parsa discloses the limitation of claims 5, 12, and 19 that said 'halt growth phase', the sender freezes the congestion window and maintains it in that state in section III on page 91. The sentence starting with "However if a loss is not preceded..." discloses this limitation. Parsa also discloses in the same section the limitation of claims 6, 13, and 20 that said entry into 'k-recovery phase' reduces the congestion window to half its original size, while the slow-start threshold is reduced to half only on the first occasion of entry into the k-recovery phase during a packet loss recovery cycle. In the 2 sentences starting with "Finally, if a loss occurs in state count = 2..." discloses this limitation. Parsa and Varshney are analogous art because they are from the same field of endeavor of congestion control in TCP. At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Varshney to freeze the congestion window when congestion is not detected and reduce the congestion window in half if congestion is detected as taught by Parsa. The motivation for doing so would have been to quickly retransmit wireless losses without a reduction in the data transmission rate as suggested by Parsa at the end of section III on page 91. Therefore, it would have been obvious to combine Parsa with Varshney for the benefit of quickly retransmitting wireless losses without a reduction in the data transmission rate to obtain the invention as specified in claims 5-6, 12-13, and 19-20.

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Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The article "An Extension of the TCP Flow Control Algorithm for Wireless Networks" by Bansal et al, U.S. Patent Application Publication Numbers 2002/0154602 (Garcia-Luna-Aceves et al) and 2002/0080806 (Ljungqvist), and U.S. Patents 6,757,248 (Li et al) and 6,711,128 (Ramakrishnan) all disclose similar techniques to that disclosed by applicant and could be used to reject amended claims in future office actions.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert C. Scheibel whose telephone number is 703-305-9062. The examiner can normally be reached on Monday-Friday from 6:30-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema S. Rao can be reached on 703-308-5463. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RCS 8-16-04

Robert C. Scheibel
Examiner
Art Unit 2666



DANG TON
PRIMARY EXAMINER